NEVARC NEWS

VK3ANE

NEVARC
North East Victoria Amateur Radio Club

Volume No: 06	Issue 12	December	2019

Next Club Meeting
Saturday 14th December
Christmas Lunch
Invitations have been sent by email to members

Australian Amateur Radio Call Signs

Callsign History – Australia

Australian Amateur Radio Call Signs may seem a little baffling but looking back at the way in which our call signs have evolved shows that it has been much more confusing in the past.

There were wireless experimenters in most states of Australia from about 1897, very soon after Marconi's demonstrations in London. Engineers from the Post & Telegraph Dept., University researchers and a few individuals duplicated Marconi's wireless system in the period 1900-1904, with varying degrees of success. There were no call signs assigned at that time, and operators simply used their station location or their names or initials as identifiers. Experimenters were supposed to obtain permission from the "Royal Navy on Australian Station", i.e. before the formation of the Australian Navy, but most didn't bother and the Navy had no wireless to hear them anyway, although occasionally visiting Navy ships were equipped with wireless equipment.

1901

The Post Master Generals (PMG)'s department was launched in Federation in 1901, but was not involved in radio activities at this point in time.

By 1904 the Australian Navy (actually the Royal Navy on Australian Station) did have several ships equipped with wireless and used the ship's names or initials as identification. For example the RNS "St George" was just "SG". The Navy was keen to restrict wireless to military purposes only, but wireless manufacturers saw Australia as a lucrative commercial market and demanded access.

The Australian Government therefore enacted The Wireless Telegraphy Act of 1905 (October 1905) to place control of wireless under the PMG's Department. The W.T. Act did provide for private experimenters but because of the high fees (£3) and severe penalties (£500 fine or 5 years imprisonment for offences) very few licenses were issued.

A Mr. H.G. Robinson obtained what was probably the first experimental license issued, in November 1905 for "experiments in halls for lecture purposes", while the Marconi Co. (NZ) obtained a license in 1906 for trials of communication between Victoria and Tasmania. Also in 1906 E.F.G. Jolley of Marlborough, Victoria, had stations in two houses about a mile apart. These licenses all expired after 1 year. By 1908 the only experimental license current in Australia was held by the engineer for the Victorian PMG, H.W. Jenvey, who built two stations early in 1908, one at St. Kilda and another 65 miles away at Queenscliff, Melbourne. In 1909 there were only two licenses on issue, held by Henry Sutton at 290-292 Bourke St. Melbourne, with apparatus capable of a 250 mile range, and C.P. Bartholomew at Mosman, NSW, with a range of 1/2 mile. Henry was issued his 'provisional license' on the 7 October 1909 by Sir John Quick, permitting a maximum signaling range of 250 miles.

In 1910 the Australasian Wireless Company was licensed with the call sign ATY, and then it obtained AAA when a new station was erected at the 6th floor of the Hotel Australia, Sydney in 1911, with 2 masts on the roof. This was the first commercial license in Australia. This was in response to the Orient Steamship Company installing wireless telegraphy stations on each of its steamers to execute the new English mail contract issued early February 1910.

As at Feb 16, 1910, just two full wireless telegraphy licenses had been issued to Senator J.C.Neild (Elwood) and Mr. G. Nightingall (Clifton Springs). The fees for these licenses were £3/3 a year.

The PMG discouraged experimenters but after representations by the newly formed Wireless Institute of Australia in April 1910 it adopted a more liberal attitude to licensing so that by August 1911 there was a total of 27 authorized "experimental" stations, 22 located in Sydney, 3 in Melbourne, 1 in SA and 1 on King Island off Tasmania.

Beginning mid-1910 the PMG Dept. issued the experimental stations with 2 letter call signs prefixed by "X" for experimental, with no distinction between states, or between private and commercial operators. For instance XAA was J.Y. Nelson (the Senior Electrical Engineer of the Sydney PMG Dept. and also the local radio inspector), F. Leverrier, a leading Sydney experimenter, was XEN, N.S. Gilmour, of St. Kilda, was XNG, Father A. Shaw of the Maritime Wireless Company had XPO and so on. By the way, the experimental license consisted of 6 foolscap pages of regulations and restrictions and sketches of the equipment. None of the equipment could be altered without approval of the local PMG authority, who could make inspections at any time. Commercial wireless telegraphy operations were retained as a monopoly of the PMG.

Experimental Licences current at August 1911

LICENSE NO. CALL SIGN NAME LOCATION
1 XBM C.P. Bartholomew Mosman, Sydney
2 Henry Sutton Malvern, Melbourne
3 XJQ W.T. Appleton Malvern, Melbourne
4a XJP J.H.A. Pike Arncliffe, Sydney
4b A.V. Robb Arncliffe, Sydney
5 XEN F. Leverrier Waverley, Sydney
6 W.H. Hannam Darling Point, Sydney
7 XPO Rev. A. Shaw Randwick, Sydney
8 G.C. Hamilton Woollahra, Sydney
9 Royal Yacht Squadron Sydney
10 XDM Maclurcan & Lane Hotel Wentworth, Sydney

11 E. Reeve Rozelle, Sydney
12 A. Mcardle Kilkenny and Enfield, S.A.
13 XAA J.Y. Nelson PMG Dept. McMahons Point., Sydney
14 H. Leverrier Gordon, Sydney
15 XCP M.C. Perry Randwick, Sydney
16 XAB A.S. Arnold Ashfield, Sydney
17 A.H. King Marrickville, Sydney
18 F.H. Day C of E. Grammar School, Sydney
19 J.S. Nolan Waverley, Sydney
20 XCA R.C. Alsop Randwick, Sydney
21 H.A. Stowe Drummoyne, Sydney
22 A. Goodwin Hamilton, Melbourne
23 C.N. Allen Chatswood, Sydney
24 H.J.B. Foley Randwick, Sydney
25 XPO Rev. A. Shaw King Island, Tasmania
(Maritime Wireless Co. of Australia)
26 AAA Australasian Wireless Ltd. Hotel Australia, Sydney - previously
27 ATY Australasian Wireless Ltd. Underwood St., Sydney

There are indications that a number of experimenters of the time did not apply for licenses, either through ignorance of the requirements or deliberately, hoping not to be caught.
When the government wireless stations at Sydney and Applecross (WA) commenced operations in 1912 they were allocated callsigns POS, for Post Office Sydney, and POP for Perth, (the other Australian stations as POA, POB, POH, POM, POP and POS) but following an international wireless convention which allocated prefixes on a worldwide basis the PO was changed to a VI, hence VIS and VIP. The government established 22 coastal stations all with VI prefixes.

In 1912 the call sign prefix letter V was a commemoration of the recent death of Queen Victoria and was used as a prefix in many Commonwealth countries from 1912. Australia was allocated the prefix group VH~VK, but these prefixes were not assigned to radio amateurs until 31 December 1928. At the same time, new regulations were introduced which banned the playing of gramophone records during the hours when broadcasting stations were operating.

In August 1912, as more and more people showed interest in experimental operation and applied for licenses, the PMG Department decided it should identify each state by changing the call sign sequence as follows:

NSW XAA to XIZ
VICTORIA XJA to XPZ
QUEENSLAND XQA to XUZ
SOUTH AUSTRALIA XVA to XXZ
WEST AUSTRALIA XYA to XYZ
TASMANIA XZA to XZZ

This meant that several call signs had to be altered to comply with the new series.
For example in NSW, J.H. Pike who had been XJP received a new call of XDY, and C.S. Crouch XRT, became XCC. This change explains the discrepancy in early lists which show different call signs for the same person.
When the initial series was filled an extra letter was added. In NSW, for instance, the block of XAA to XIZ allowed for 234 licenses, and when they were used up the series was continued as XAAA - XIZZ. At the time an experimental license cost £1/1/-. The Wireless Institute of Victoria printed a call book in about June 1914 listing every known amateur and commercial & shipping station, with information from PMG records.

The XAAA type call identification became a little cumbersome so in July /August 1914 the calls were altered to X with a number to identify the state, then 2 letters, eg the PMG Radio Inspector's call in NSW became X2AA. See the XJBI license document. Not many licensees had the chance to use the new calls before the declaration of World War 1 and all wireless experiments ceased in August 1914. Several people and organizations did obtain special permission to continue operations, such as the Perth Wireless Club, as a listening post only, for suspected spies in W.A. and Ernest Fisk, Manager of AWA, who could both transmit and receive. The Government wireless stations continued in operation but in November 1916 the Navy again took control of all wireless, including the commercial and government stations.
After WW1 the Navy still controlled the airwaves and was reluctant to allow wireless experiments but following extended negotiations between the WIA and the Navy, Radio Commander Creswell agreed in June 1919 to issue Temporary Permits to experiment in Wireless telegraphy. These were for receiving only but permits to transmit and receive were issued to the WIA, a couple of Universities and one or two prominent experimenters. There were added restrictions to be observed if the licensee wished to use a valve (usually in a regenerative circuit which could perhaps cause interference to Navy wireless). At this time the Naval Director of Radio Services instigated a new call sign system consisting simply of the sequential license number, prefixed by the state initial. For instance R.H. Davies of Melbourne obtained license number 237 so his call sign was V.237 whilst the next applicant, A.B. Cummings in Queensland was call sign Q.238. By February 1920 more than 600 permits had been issued. In April 1920 the Government took charge and re-introduced regulations allowing experimental and instructional licenses. An experimental license cost £2/-/-.

In September 1920, the Government amended the Wireless Telegraphy regulations to remove all wartime restrictions and placed the control of wireless under the "Director of Radio Telegraphy, Prime Minister's Department, Melbourne".
The Prime Minister was in discussion with AWA over a UK/Australia communications link and wanted to keep close control of wireless, and the PMG was reluctant to take back responsibility for commercial wireless anyway because it was a money losing situation. When the new Director took over from the Navy in early 1921 he changed back to the pre-war call system of X2AA etc. Some "transmitters", as they were called, requested specific call signs, so for example one leading transmitter, Charles D. Maclurcan, obtained X2CM.

Other less prominent experimenters who wished to transmit were discouraged until 3rd November 1922, when further new regulations were released, allowing experimental wireless in 2 categories:-

a) transmit and receive and b) receive only.
The receive only license was further split into:
i) crystal receiver and ii) valve receiver.

The cost of a license became £1/-/- for the full license and 10/- for the receive only license.

If a licensee had a valve receiver he had to be able to read Morse code at 12 WPM, the reasoning being that if the valve broke into oscillation (as was likely with the unstable circuits or regeneration commonly used) and was interfering with one of the navy or commercial stations, which were still using Morse, they could come back and tell the offender(s) to close down.
The PMG's Department reluctantly took over the control and licensing functions from the Prime Minister's Dept. at this time, and the call signs were altered yet again, to XA2AA, XA3AA etc. where "X" was for experimental and the "A" identified Australia on an international prefix system.

Note that licenses and call signs were issued for receiving purposes too, and in fact very few licensed experimenters actually had transmitting equipment. Up to this time there were only about 60 genuine amateur transmitters in all Australia. The other approx. 650 licensees were in fact "listeners" i.e.. they had receivers only and most had little technical interest or expertise, BUT they did have valid call signs.

The Experimental License that was issued during this period was endorsed with either:

T -- to signify approval to Transmit and Receive
R -- to indicate Receive only and then C -- crystal or V -- valve

The regulations also provided for a Broadcast License which allowed an experimenter to transmit news and entertainment, but no advertising or payment was permitted. Other restrictions were the same as for the experimental Transmit License.
As it cost £5, few experimenters took up this license but a few did set up broadcast facilities and some went on to become prominent broadcasters.

From 1922

Although the regulations did not come into effect officially till 1 December 1922, experimental licenses were issued from October 1922 with both transmitters and listeners receiving call signs. By mid-1923 around 700 call signs had been issued and NSW had used up all its 2 letter allocation and was about to issue 3 letter calls. However, in May 1923 the PMG decided to hold all further applications pending the release of new regulations which would include commercial broadcasting. There was growing public and industry agitation for broadcasting, so a conference of all interested parties was held in May 1923 to organize and regulate public broadcast operations.

The 1923 Broadcasting Conference included representatives from all groups interested in wireless, who framed regulations to introduce and control public broadcasting. The conference was dominated by Ernest T. Fisk of AWA, who pushed through his proposal for the infamous "Sealed Set" system, whereby listeners could use a receiver tuned and sealed to receive one station only for a fee of up £4/4/- per year, with additional costs if one wanted to listen to another station. Experimenters lost some privileges to commercial interests and were misled by certain delegates. The new regulations were delayed so the PMG started to issue experimental licenses once again, but this time only genuine transmitters received a call sign.

When the new broadcast regulations finally became effective in August 1923 a new class of license was issued, a "Broadcast Listener's License", costing 10/-.However, it was obvious that obtaining a receive only experimental license for 20/-, with no restrictions on tuning, was cheaper than the broadcast listener's license plus the station fee of £2/2/- to £4/4/-, and so somewhere around 1000 "listeners" applied for experimenter's licenses. The broadcast stations soon complained that they were not receiving their expected fees so the PMG sent out letters to people who had receive only experimental licenses, cancelling those licenses and call signs and telling them to apply for a broadcast listener's license. Many licenses were in fact cancelled, but someone objected in early 1924 and the government found that as the license was validly issued, it could not be cancelled, even though the licensee was not in all fairness a wireless "experimenter".
To solve that problem, as each license came up for renewal after 12 months, the licensee had to demonstrate that he was actually competent to experiment with wireless and was not just a "listener". Previously, any exam or Morse test was at the discretion of the radio inspector and it appears very few previous applicants had to prove they knew anything about wireless.

With the new approach, the number of experimental licenses in the period 1924-1925 dropped significantly from the 1923 level and many names and call signs vanished. It was estimated in early 1925 that there were about 1200 experimental licensees in Australia, of which less than 90 were transmitters and the rest, even though they held call signs, should have been reclassified as Broadcast Listeners. Deleting all these listeners from the call sign lists left many gaps in the sequence up till the mid-'40s when growth in numbers finally made the 3 letter call sequence necessary.

This practice of issuing call signs to listeners with no real technical expertise raises a problem concerning claims by some old timers' to precedence in amateur activities. For instance Miss F. Violet Wallace (later Mrs. McKenzie), is regarded as the first Australian female amateur, but the records show that there were four ladies, all listeners only but with valid call signs, before Miss Wallace obtained her license.

During the 1922-25 period experimenters were blamed for interference with other stations, and the Wireless Institute was keen to make a distinction between true "experimenters" who were engaged in research and wireless construction, and those who they called "amateurs", who were only listeners, using store bought or simple kit-built crystal or 1 valve sets. The amateurs were to blame for interference with broadcasts, but of course experimenters were more proficient!

The Fisk "sealed set" scheme mentioned above was a failure and less than 12 months later another Broadcast Conference convened and new regulations closer to the present broadcast rules were issued by the PMG in July 1924. At this second conference the experimenters came under further pressure and lost more band space and privileges.
One recommendation of the conference was to revoke all experimental licenses and instead issue no more than 980 "Expert Experimental Licences" Australia wide to genuine experimenters, to be approved by the WIA.

The proposed allocation per state was to be:

NSW	VICTORIA	SOUTH AUST.	WEST AUST.	QLD	TAS.
300	300	100	100	150	30

Fortunately the PMG rejected this proposal, and when it issued new Statutory Regulations in July 1924 it clarified the Experimental License and Broadcast Listeners License and at this time introduced formal examinations for the Amateur Operators Certificate of Proficiency (AOCP). The Morse code requirement was 12 words per minute (WPM) and the exam cost 5/- whilst issue of a certificate cost another 2/6.

28/7/1925 PMG Wireless Branch writes to radio amateurs with approval to use the 20-36 meter band until 30/11/25.

13/10/1925 PMG Wireless Branch advises amateur band allocations are now 125-250m, 85-95m, 32-37, 21-23m and 8-10 meters.

23/6/1926 PMG Wireless Branch gives permission to use 100W for 6 months on the 8-10, 21-23, 32-37, 85-95 meter bands until 30/9/1926 when it is to be reconsidered.

A further change in the call sign identifier occurred in 1927 when another international radio conference decreed that Australia should use the prefix OA effective from 1 February 1927, so we then had calls such as OA3BM, Howard Kingsley Love. "O" was for Oceania and "A" for Australia.

1928 Radio Operator

Only a couple of years later yet another international agreement saw the calls changed to the current VK plus a number prefix, for instance VK2JP (J.H. Pike again). That change came into force at midnight of 31 December 1928, but the PMG Chief Radio Inspector, Mr. Jim Malone, decided that VK call signs would be used from 8 December 1928 so that the change would be fully implemented by 1 January 1929, which explains why some contacts and QSL cards seem to have jumped the gun by quoting "VK" calls prior to January 1929.

8/12/1928 PMG New Regulations effective from 31/12/1928 with bands available being 60,000Kc(5M)-56,000(5.35M), 30,000(10M)-28,000Kc(10.7M), 14,400Kc(20.8M)-14,000(21.4M), 7,300Kc(41M)-7,000Kc(42.8M), 1,990Kc(150.8M)-1,715Kc(175M), 1,715Kc(175M)-1,200Kc(250M).

There does not seem to be any official declaration of the call sign format so many experimenters used their own interpretation by adding a hyphen or a full stop to their call signs as printed on QSL cards, such as XA-4CD, OA2-BH, VK.2AK and VK-4SU. There was even VK3D.L. and VK3--H--W. Some, perhaps speculating on further changes, abbreviated their QSL cards to show just the number and letters, such as 4WK and 5BJ. Magazines of the era often left the prefix off the calls when reporting experimenters' activities anyway.

1939
Amateur Licences in Australia were withdrawn on 31 August 1939. *Refer to the Telegram advice photo.*

Telegram advising to cease radio operation in Australia

Previous external Australian territories call sign prefix history was:
- Christmas Island – ZC3 (pre-1940), Japan (1940 to 1944), 9V (1945 to 1958), VK9X from 1958.
- Cocos Keeling island – ZC2 (pre-1940), VK9Y (1955 to 1992), VK9C from 1992.
- Papua New Guinea – VK4 / VK9, now P29 from 1972.
- Nauru – VK9 now known as C2 (since 31 January 1968).
- Macquarie Island - VK1 to 1955, VK0M since 1955.

Finally, the PMG recognised a changing understanding of the terminology and "Experimental Station Licensees" officially became "Amateur Station Licensees" from 19 September 1947.

Callsigns subsequently were issued as a 2 by 2 call sign, i.e. VK^nXX and VK^nA^{XX} formats.
Licensees also were able to obtain a call sign for "Mobile" station operation.

The Limited Amateur Operators Certificate was introduced in 1954 and issued to applicants who were restricted to using the VHF bands and above and without Morse code privileges (CW). The limited license callsigns were issued using the Z suffix, eg VK^nZ^{XX}. The 3rd LAOCP license in Australia was issued to Mr. Frank (Mick) Pettiford in Queensland, VK4ZAA.

VK0 callsigns only came about (around 1955 ??) , keyed around the Antarctic treaties at the time. Until that time, Macquarie Island and Antarctic area ? callsigns were known as VK1.

1975

In 1975, a Novice license was introduced using the call sign format VK^nN^{XX}. From 1980 those with both restricted and limited accreditations, the call sign format of VK^nJ^{XX} and VK^nK^{XX} was used, and was later called the Intermediate license.
The Novice Limited call sign was introduced later and used the VK^nH^{XX} format for novice stations without any CW privileges.
The Papua New Guinea call sign prefix was known as VK9 (and VK4 for a period) until 1972 when it became a United Nations Trust Territory and was assigned the P29 call sign prefix.
The Australian call sign prefixes AX, VL, VM, VN and VZ were added around 1973, but only the VI and AX prefixes are ever issued (with usage restrictions) to amateur operators in Australia since 1979 .

2000

The AX prefix is permitted to be used to substitute for the VK prefix during commemorative events, such as the 1988 Bicentennial, 2000 Sydney Olympics and Australia Day (January 26 each year). The AX prefix is generally assigned in a more permanent fashion to military and experimental license holders.
The Australian Government (SMA, DoC) up until 2001 had retained the call sign sequence VK^nAA for use as their 'official call sign'. These were released over a 8 month period from mid 2001 to early 2002. The first releases of these "AA" suffixes had no publicity, but once word got around, the bar was raised for the allocation of the last couple of callsigns, eg, VK8AA and VK7AA required applicants to provide a full written justification along with the usual license application forms.

When the Australian Communications and Media Authority (ACMA) dropped Morse code from Amateur licensing exams on 1 Jan 2004, only the VK^nXX series callsigns were being re-issued to previous holders of 10wpm Morse accreditation, and were not available to new applicants. From 19 October 2005 licenses were consolidated into 2 classes, Advanced and Standard, and VK^nXX series were being quarantined pending new equitable issuing rules until 2008.

On 1 Jan 2006, the ACMA introduced a 3rd class foundation license using the general call sign format VK^nFXXX , and in the external territories eg $VK9F^{XXX}$ for Christmas Island, $VK9FN^{XX}$ for Norfolk Island etc.

The external territories call sign prefixes are known as:
• Christmas Island $VK9X^x$, $VK9X^{xx}$ and adding $VK9FX^{xx}$
• Cocos Keeling Island $VK9Y^x$ changing to $VK9C^x$, $VK9C^{xx}$ in 1992 and then adding $VK9FC^{xx}$ in 2006.
• Lord Howe Island VK9H changed to VK9L in 1992 and adding $VK9FH^{xx}$ in 2006.
• Norfolk Island VK9N and adding $VK9FN^{xx}$ in 2006.
• Willis Island VK9W and adding $VK9FW^{xx}$ in 2006.
• Mellish Reef – VK9M and adding $VK9FM^{xx}$ in 2006.
• Macquarie Island – VK0M changed from VK1 circa 1955.

A new ACMA policy, effective February 15, 2008, allows amateurs who hold a non-Australian Amateur Radio license to operate up to 90 days under a Class License; licensees who will be in Australia for more than 90 days will need to apply for an Australian Amateur Radio license.

From 16 May 2008 holders of Australian Advanced licenses are now able to operate in the participating CEPT countries while visiting those countries on the basis of their Australia license. In mid 2008, the ACMA and WIA introduce a ballot bidding scheme for the issue of 2x2 VK callsigns eg VK^nXX. There is anticipated to be 2 call sign ballots per year. This came in response to an unfounded perception that 2x2 VK callsigns (eg VK2CZ) have some type of exclusivity or advantage.

Oddly, around mid 2009, the ACMA then restricts the issue of VK^{n}Z^{xx} callsigns only to those who have previously held them(*?? not 100% what the conditions are, but they are quite restrictive - happy to receive accurate advice).* As a result some operators are now returning to their old "Zed" callsigns, as these are now deemed "exclusive".

2010

On 2 Jan 2012, the ACMA permitted applications for a 1KW PEP RF power permit to Advanced licensees operating on restricted parts of the HF allocations. The 160m and 30m bands; and the 40m allocation from 7.1MHz to 7.3MHz are presently excluded, and no portable / mobile operation at this power level is permitted. The permit cost $41, and was initially valid for up to 5 years, dependant on your base license expiry date.

The ACMA and WIA have not publically released their logic behind the 1KW permit band restrictions, with opinion that the 160m was never requested or is classed as being outside the HF bands, and the remaining bands are not primary allocations. Traditionally and historically Australia and New Zealand have each boilerplated and reciprocally cross adopted most new licensing legislation and regulation rulings effecting telecommunications, however with New Zealand leading the 1KW permit change, the ACMA and WIA had to do something in response. While the ACMA conditions requires an EMR Safety Compliance submission, the WIA do not. With many 1KW permits now being issued without any EMR safety assessments, clearly shows it is about the money or popularity of the permit only.

The ACMA suspended the 1kW licenve permit after 8 months, citing that approx 150 licensees actually applied for the permit, but only 25 or so actually submitted EMR Safety compliance documentation.
While the ACMA was open to supporting the high power concept, the poor response with EMR safety assessments was interpreted as an uncaring attitude to safety.

2014 - 2018

Nothing to report.

2019

Following a 2018 open tender, AusTender reference 18ACMA148, the ACMA selected the University of Tasmania - Australian Maritime College (AMC), deliver amateur radio examinations, issue amateur certificates of proficiency and for related call sign management. The Wireless Institute of Australia (WIA) Deed of provision of services came to an end on 1 February 2019.

The ACMA is finalizing a Deed with the AMC for the delivery of services and will make enabling instruments available to support the AMC's engagement.
Once executed, the ACMA expects AMC to progressively commence delivery of services from 25 February 2019.
During the transition, ACMA will consider any applications for certificates of proficiency directly.
A certificate may be issued if the applicant has successfully sat an approved examination under the previous WIA arrangements.

<div align="center">

~ Engineering and Technology History Wiki
https://ethw.org/

</div>

References

- David E Burger VK2CZ / VK8AA;
- Australian Archives; - Mitchell Library (The University of Sydney);
- Amateur Radio magazine (Wireless Institute of Australia);
- The ARRL and their QST magazines;
- ACMA (also known historically as the Spectrum Management Agency (SMA), Department of Transport and Communications (DOTC), Department Of Communications (DOC), Australian Post Office (APO) and PMG Licensing);
- Manly Warringah Radio Society;
- Mr. Ian L Herrmann VK3YDY (dec);
- Ms Lorayne Branch (Great grand daughter of Henry Sutton);
- Mr. (Mick) Francis Pettiford VK4ZAA;
- The document collection of the late Mr. Colin MacKinnon with permissions from Christine;
- The Melbourne Age (David Syme) and Argus newspapers, Feb 16 1910;
- Bill Roper VK3BR and Peter Wolfenden VK3RV; and
- Richard Rogers, VK7RO and reference to the Tasmanian Archives for Trevor Watkins 7AA.

HILARIOUS THINGS THAT REALLY HAPPENED WITH NUCLEAR WEAPONS
BY BENJAMIN BUSO

Nuclear weapons are literally the most metal thing ever made.
Nuclear weapons are constructed using actual heavy metals. Check out the periodic table if you don't believe us. Anyway, nukes can destroy the world, and because of that, they're treated with the utmost respect. Unfortunately, nukes are also handled by human beings, and human beings have an uncanny knack for being able to do some impressively stupid things when they think nobody's watching.

AMERICA'S NUCLEAR LAUNCH CODE WAS SET TO DEFAULT

There's a very complicated process for using nuclear weapons, for a very good reason. Theoretically, the military would choose a target, make their case to the president, who would then authorize the use of nuclear weapons by typing a unique launch code unique into a briefcase-size device referred to as the "nuclear football." At that point, over the course of a few minutes, the nukes would be armed, sent toward their target, and we all start cosplaying as Fallout characters full time.

The entire process for ending the world hinges on the president's authorization, so it was a little frightening that the president's launch code for American-based nuclear weapons was set to 00000000 for twenty years or so. The military claimed that they needed a simple and streamlined system in place because in the event of a nuclear attack, a response would have to be made almost instantly. Typing in a super complicated code would add dozens of seconds to the time it would take to destroy half the world, and that was something the military could not live with.

Eventually, the launch codes were changed to something a tad more complicated, before the "0" could get stuck in place.

PRESIDENT CLINTON LOST HIS LAUNCH CODES

A lot of things happen when a new president takes the oath of office. They're given control of the presidential Twitter account, are told a whole lot of terrifying secrets that the general public is not ready to hear, and are given a tiny handheld device called a "biscuit" that has the launch codes necessary to use America's substantial nuclear arsenal. With it, the president can end life as we know it. Without it, America's nuclear weapons become expensive paperweights. It goes without saying that the biscuit's kind of a big deal, and presidents take the biscuit very seriously … with one noticeable exception.

During his time in office, President Bill Clinton was fond of two things: impromptu trips to McDonald's and misplacing his nuclear launch codes. According to retired General Hugh Shelton, Chairman of the Joint Chiefs of Staff during the end of the Clinton era, the president lost his codes all the time. Most of the time, the biscuit was quickly located by panic-stricken aides hoping to prevent the apocalypse. Other times, Clinton lost the thing for months. This really happened. President Clinton corroborated these stories years after leaving office.

While it's a little frightening to think at one point in time the president couldn't use his nuclear arsenal, it's important to remember that nuclear weapons are like condoms: better to have one and not need it rather than need one and not have one.

ATOMIC CIGARETTE LIGHTER

Lighting a cigarette is a relatively straightforward process. You place a cigarette in your mouth, delude yourself into thinking you'll be quitting soon, apply an open flame to the end of the cigarette that's not in your mouth, and then inhale that lovely carcinogenic smoke. Anyway, that's how chumps light their cigarettes. Theoretical physicists tend to light their cigarettes with a little more creativity.

On June 1, 1952, theoretical physicist Ted Taylor was present at a nuclear test and devised a way to light his cigarette by redirecting the light generated by the explosion through a parabolic mirror he found lying around. After suspending the mirror in the air, Taylor adjusted the mirror so a concentrated beam of light energy was directed toward the tip of his cigarette. As the atomic bomb was detonated, a superheated beam of light hit the tip of his cigarette, and the rest is smoke break history.

NUKING NORTH CAROLINA

The thriving metropolis of Goldsboro, North Carolina, seems like the last place on the planet that someone would waste a nuke on, which is exactly why two nuclear weapons were dropped on the city back in 1961. During a routine flight, a B-52 bomber carrying two nuclear devices tragically broke in half, and the two devices crashed into a swamp. Normally, when nuclear devices are being transferred from one location to another, they're rendered safe, and a six-step process is necessary to arm the device. The crash somehow completed five out of six of those steps.

The two bombs headed toward Goldsboro at 700 miles per hour and created a rather impressive crater on impact. The weapons disposal specialists managed not to let their massive testicles hinder them from disarming the two devices. Had the devices detonated, conservative estimates place the death toll at around 90,000, and it's quite likely that an unscheduled nuclear blast in North Carolina would have resulted in hundreds of other unscheduled nuclear blasts around the globe.

THE FIRST NUCLEAR REACTOR WAS IN A MAJOR POPULATION CENTRE

A nuclear reactor will generate plutonium—the stuff that powered Doctor Brown's time machine—and that plutonium will be used Pinterest-style to craft a nuclear weapons. It's a pretty complicated and dangerous process, which is why it's usually happens in remote locations … today, anyway.

The first nuclear reactor—then referred to as an atomic pile—was built out of wood panels and graphite bricks underneath a football field. A football field at a college. A college located in the centre of Chicago.

Safety concerns were taken into consideration when the pile was started up. A three-man team referred to as a suicide squad stood by with buckets of water and were ready to douse the reactor in the event it began melting down. They may or may not have been pleased to learn that this was roughly the same safety procedures later used in Chernobyl.

GETTING NUCLEAR COMPONENTS BY ACCIDENT

America and Taiwan have a rather awkward diplomatic relationship. Well, technically America and Taiwan have no diplomatic relationship. It's really complicated, but the People's Republic of China and the island nation of Taiwan are two different countries, but don't tell them that. China believes that Taiwan is part of Mainland China, and Taiwan prefers to remain independent from China for some odd reason. Mainland China has diplomatic relations with the United States, and for a variety of geopolitical reasons, America can't acknowledge that Taiwan exists even though they're both totally Facebook friends.

Just because mainland China and Taiwan have issues is no reason for private American companies and the US State department not to accidentally—wink wink—send weapons to Taiwan. Most of the time, arms transfers between America and Taiwan are in this awkward grey area that no one talks about unless that transfer contains components for nuclear weapons. That totally happened in 2006. Even more awkwardly, no one on either side noticed or acknowledged this till 2008. It's probably best not to think about what China would have done in the event that Taiwan became a nuclear power. Diplomacy and international arms transfers can reach open relationship levels of awkward.

NUCLEAR PERSONNEL REGULARLY GOT HIGH

Missileers—those in the Air Force tasked with pushing the proverbial button—have a really demanding job. Every day, they climb down into an underground cubicle and hope that they will not have to do the one thing that they've spent years learning how to do. While underground, their supervisors will often write them up for minor infractions in the hopes that they themselves can be transferred out of the missile silo. On top of all of that, missileers constantly have to take written tests over launch procedures. If they fail those tests by scoring slightly less than perfect, they will be kicked out of the Air Force and will have to cough up the cash to pay back the government for their rather expensive education.

Is it any wonder then that the people who control America's nuclear arsenal are high as balls?

For years, missileers who did not get the memo to study for their random drug tests have tested positive for nearly every drug known to man. Some missileers blow off steam by going on drunken benders with individuals who may or may not be Russian spies. Others go through their long shifts thanks to some Peruvian Marching Powder. It's possible that the drugs that get the party started at Burning Man or Coachella every year came into the country in the same load that missileers use to get through the day. Sleep well tonight.

NUCLEAR WEAPONS RELY ON OBSOLETE TECHNOLOGY

The technology that controls America's collection of doomsday devices is a little old. Maybe "vintage" is the better term. Data is transferred to computers using floppy disks the size of a pizza. The collective processing power for every computer in every American missile silo is, rounded up for clarity, about 1 percent that of an iPhone … the first iPhone. A lot of the companies that manufacture the computer hardware that supports America's nuclear arsenal went out of business years ago.

All of this painfully obsolete technology might sound a little frightening, but it's a good thing for the security of America's nuclear arsenal. The technology to "hack" a nuclear missile does not exist. These computers are pre-Internet. The programing language used by the computers that would launch nuclear weapons is known by a few dozen people at most, and they aren't the types who talk about their jobs very often. Plus, a sentient artificial intelligence would have absolutely no idea how to go about taking control of every nuclear weapon in the country, so that's a little reassuring.

SANTA ALMOST STARTED A NUCLEAR ATTACK

Back in the 1950s, America's considerable nuclear arsenal was controlled at a place called Continental Air Defense Command (CONAD). CONAD was home to the first phone of mass destruction, nicknamed "The Red Phone." If that phone ever rang, Air Force personnel were under orders to launch every weapon in their arsenal toward the enemies of the day. That phone was never supposed to ring.

Colonel Harry Shoup, the Air Force officer in charge of answering the Red Phone, had a series of minor heart attacks as that phone keep ringing on Christmas Eve of 1955. See, a toy store in Colorado Springs printed up an ad where children could call a number and speak with Santa. Unfortunately, there was a misprint in that ad, and the children who called ended up speaking with Colonel Shoup.

Colonel Shoup was a pretty good sport about the phone calls and kept the children informed as to Santa's whereabouts. In a series of escalating events more suited to an apocalyptic Hallmark movie than reality, World War III was delayed, and NORAD—the successor organization to CONAD—began using its considerable resources to begin the annual tracking of Santa Claus, and the children of the world learned the true meaning of a radiation-free Christmas.

LEAVING NUKES ON A RUNWAY

There's nothing wrong with forgetting where the car keys are, where that really awesome Thai place—the one with that peanut sauce—was, or what the parents' HBO Go password is. Forgetting about a half dozen nuclear missiles and leaving them on a plane are words that should never be used in the same sentence for a variety of reasons. Back in 2006, the Air Force was transferring six cruise missiles equipped with nuclear weapons from a base in South Dakota to one in Louisiana. No one told the crew transporting the missiles that they were equipped with nuclear warheads.

After a three-hour flight, the plane landed, and the crew went about their business. A collective panic gripped the base when it was discovered that a half dozen loose nukes were floating around … 36 hours after the plane landed. On top of losing a bunch of nuclear missiles for 36 hours, apparently transporting nuclear missiles in that manner violated a few arms reduction treaties signed back in the 1980s. Smart phones and rental cars have tracking devices, and not one person thought it might be a good idea to stick one on a nuclear weapon?

~Internet

NASA considers this 80-year-old radio buff part of the astronaut family

~Bec Whetham

Tony Hutchison's obsession with radio as a 10-year-old turned into a 30-year association with NASA

To NASA personnel, he is VK5ZAI. To his neighbours at Pinks Beach, a small coastal town in South Australia, he goes by Tony.

In his 30-year association with the US space agency, Tony Hutchison has been called upon to help in times of crisis, moderate calls between astronauts and their families, and run a worldwide schools program.

He's shared a beer with first commanders, had barbecues with mission specialists, and watched the space shuttle launch from the bleachers at Kennedy Space Centre.

Looking back, it's a life he never expected.
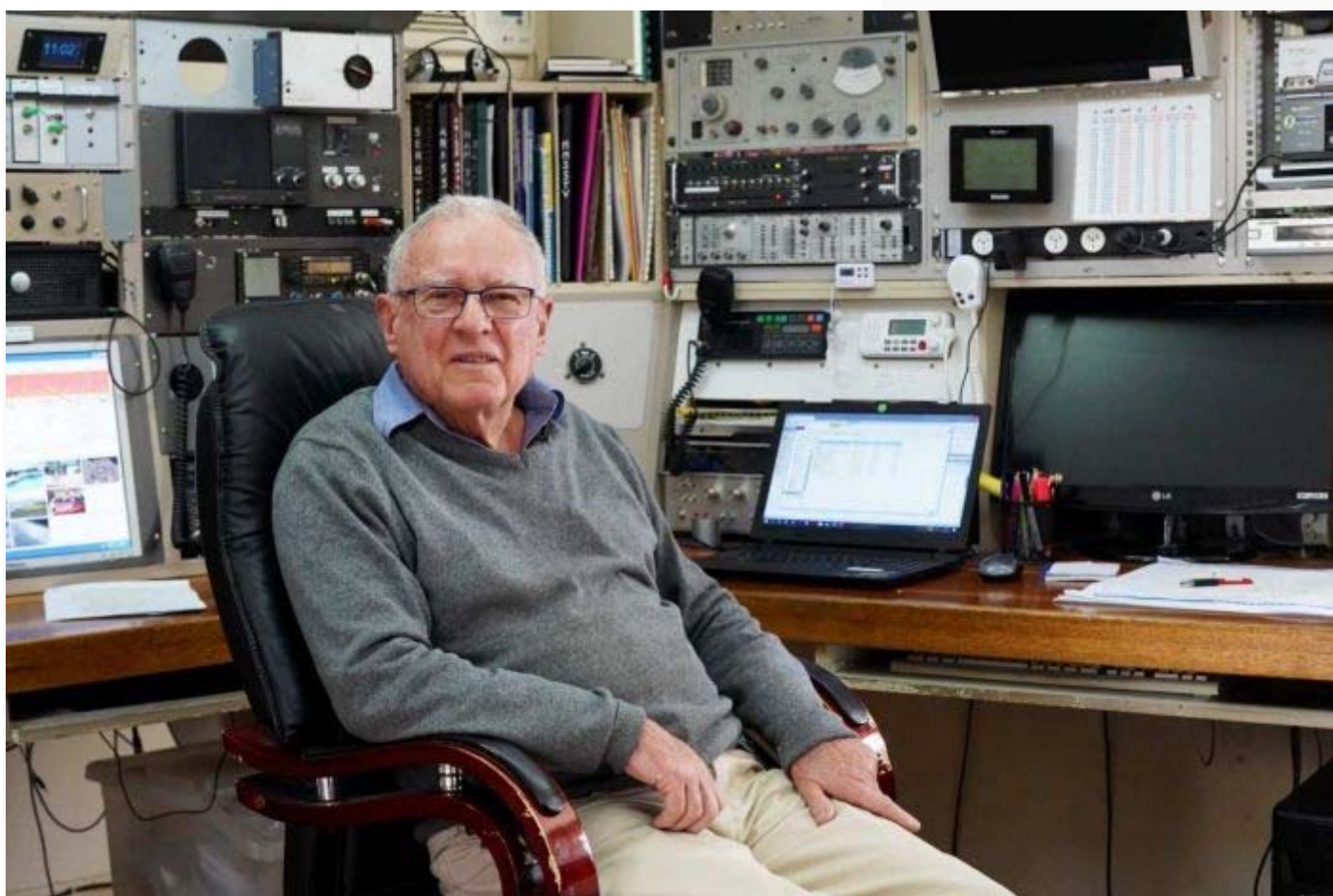
Mr Hutchison has built a large radio shack into every home he's owned (with his wife's blessing)

From amateur radio buff to NASA's go-to guy, Mr Hutchison, 80, fell in love with radio at age 10, had his amateur radio licence by 21, and became involved with satellite communication a few years later.

In October 1992 he made his first contact in space — cosmonaut Anatoly Solovyev onboard the Mir space station. "You could talk up to them as they passed over and they'd talk back to you."

The neighbours didn't know what to think when three large aerials went up after the Hutchisons moved in

For the next year Mr Hutchison was fielding regular conversations from his home radio shack with the low-orbiting laboratory.

"The Russians liked to brush up on their English language a bit. They would call and one day I got a reply from them. That spurred me on a bit."

His radio shack is covered with framed photos, certificates and thank-you letters from over the years.

He became good friends with one of them, Aleksandr Serebrov.

"He would call me probably a couple times a week as he passed over. Of course they keep to Russian time, which is almost the opposite time to us, so it would be in the middle of the night and Alex would call."

NASA eventually caught on and had Mr Hutchison doing communications for Andy Thomas while he was on board Mir.

PUTTING CHILDREN IN SPACE

It was Serebrov who took part in Mr Hutchison's first school link-up in 1993.

A group of keen country kids from Loxton High School went to Mr Hutchison's radio shack in the Riverland, where they asked the cosmonaut questions about life and space.

"It's quite an adrenalin rush when you hear the voice come through: 'Hear you Tony loud and clear, go ahead please.' Even after as many as I've done, it gives me a great thrill to hear that voice first come through."

A student at Kingston Area School waits for an astronaut to answer her question during a link-up with the ISS.

When Mir's days were coming to an end, NASA asked Mr Hutchison to help form a school program for a new venture, the International Space Station (ISS).

By the time of launch in 1998, Mr Hutchison had helped form Amateur Radio on the International Space Station (ARISS).

In its 20 years, ARISS has connected astronauts to 1,300 schools worldwide, 70 of which are in Australia.

"It's taken up a lot of my time. I've thoroughly enjoyed it," Mr Hutchison said.

"You've got several hundred at the school waiting at a remote site, and you've got the astronaut waiting on the space station — you might call once, call twice before the station comes within range."
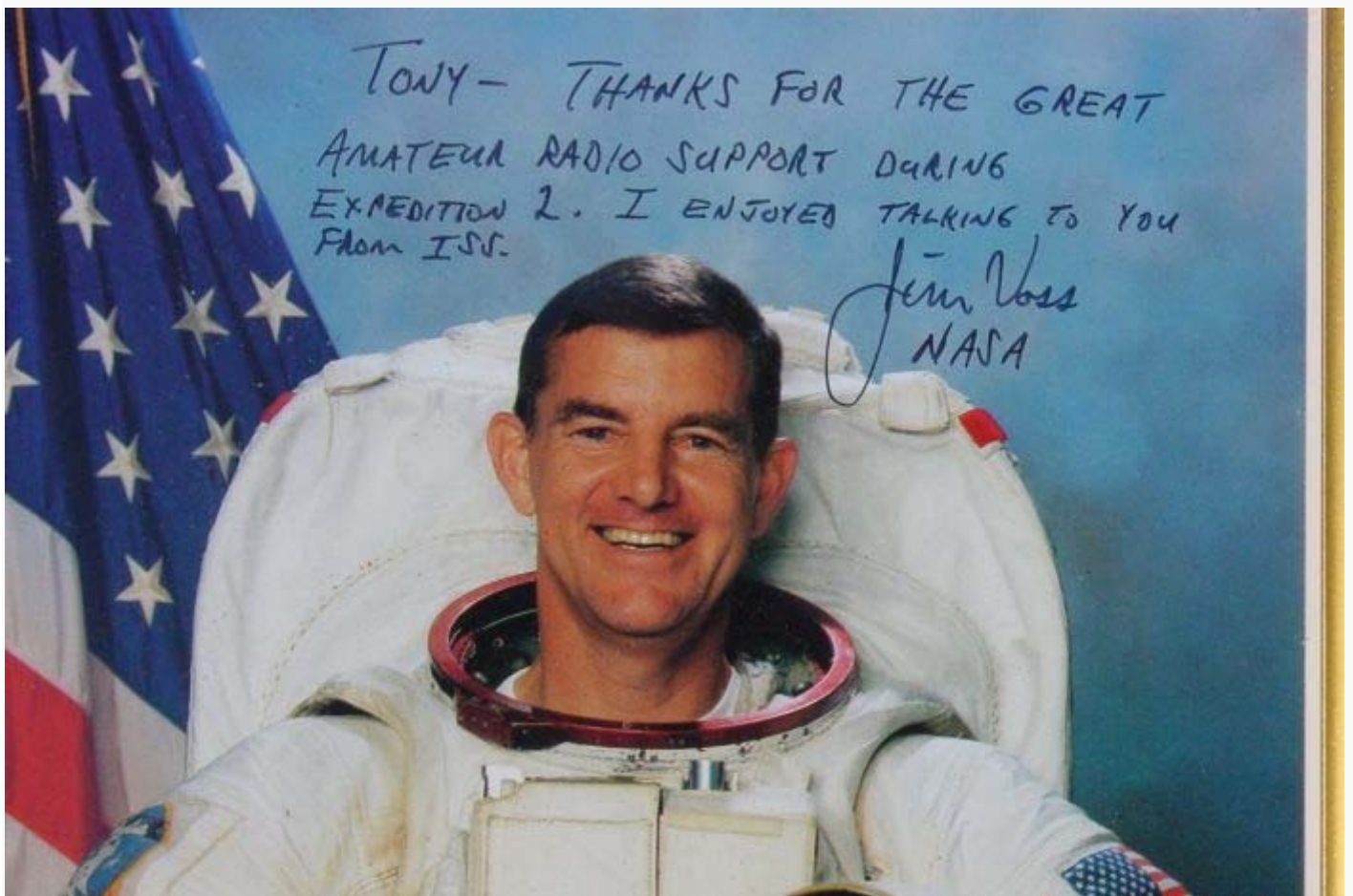
Of the thousands of students who have taken part, some have gone on to space science.

"We have one desire, to pass on our knowledge to the next generation and encourage children, kids, university students to continue with their work in engineering, science, mathematics," Mr Hutchison said.

Unlike a casual chat on the phone, he said linking students with astronauts was a different thing entirely.

Mr Hutchison has accumulated a lot of equipment over the years

TONY — THANKS FOR THE GREAT
AMATEUR RADIO SUPPORT DURING
EXPEDITION 2. I ENJOYED TALKING TO YOU
FROM ISS.

Jim Voss
NASA

A signed photo from astronaut Jim Voss thanking Mr Hutchison for his service and friendship. (Supplied: Tony Hutchison)

FRIENDS AND FAMILY OUT OF THIS WORLD

Mr Hutchison has spoken with close to 100 astronauts in his time, from a bit of banter to ensuring the line quality between an astronaut and their spouse during precious moments of connection.

"You can hear everything, but you don't disclose the private conversation. It's a great honour."

In 2001 NASA invited Mr Hutchison and his wife Jill to attend a shuttle launch. They were also able to meet some of the many astronauts VK5ZAI had heard but not seen, including Bill Shepherd, the first commander of the ISS.

"I had no idea that I'd ever get involved with astronauts the way we have."

He returned to NASA with a group of amateur radio friends from Australia

Saying no to NASA

During the trip, NASA offered Mr Hutchison the chance of a lifetime — a two-year contract with master control in Houston. After discussing it most of the night at their motel, the couple opted to turn it down.
With children and grandchildren back home in Australia, they decided the timing was not right.
At the end of 2019, Mr Hutchison will step back from ARISS indefinitely.
"It's been a wonderful life ... I just feel as if I'm getting a bit stale and it's a little bit hard on Jill," he said. "She certainly knew what she was getting into, I think, when we got married, and she's backed me all the way. I've been very fortunate.
"We've got a little motorhome and want to do a bit more travelling around Australia."

With talk of NASA building a new base on the Moon in a few years' time, Mr Hutchison is not ruling out a return.
"I'm getting a bit old but I hope I'm around to see it. I'm looking forward to that."

The Hutchisons with mission commander Bill Shepherd on their 2001 trip to the United States. (Supplied: Tony Hutchison)
"I've been fortunate and had the privilege to meet a lot of these guys, just average guys with a brilliant mind, and you can sit down and have a good conversation about their life."

The Hutchisons were treated as friends and family of the astronauts, dining with the crew before the launch and watching take-off from a little stand three kilometres from the site.

"The noise is incredible, you feel your whole body shake ... all of a sudden you'd hear this enormous roar, you could feel it right down your spine."

Tony Hutchison has devoted his life to amateur radio

~Internet

Yarra Valley Hamfest Report

Less than an hour's drive for most Melbourne hams, the mid October Yarra Valley Hamfest is one of the more relaxed Hamfests in the picturesque Yarra Valley and you can tour the all the wineries afterwards. The town has a great bakery in the main street.

It does not seem to draw the big crowds of the other Hamfests but still bargains to be had if you know how to negotiate.

The pictures tell the story…

NEWS BITS

HF RADIOTELEPHONE MONITORING OF DISTRESS AND SAFETY COMMUNICATIONS

The Australian Maritime Safety Authority is seeking feedback on the proposal to cease HF radiotelephone monitoring of distress and safety communications in Australia on 1 January 2022.

The state and Northern Territory marine agencies or volunteer marine rescue organisations monitor the HF radiotelephone distress and safety calling frequencies. The proposal to cease monitoring has come from the Maritime Agencies Forum (MAF), a national body that enables marine safety agencies to identify, agree and monitor the ongoing work required to implement the National Standard for Commercial Vessels, which coordinates technical maritime safety advice and operational maritime policy nationally.
However, the use of HF radiotelephone as the first and only means of distress and safety calling has steadily declined.
In the four-year period to March 2018, there were only two distress and six urgency communications initiated by vessels, where only HF radiotelephone was used.

The consultation applies to all vessel categories; however, vessels operating outside VHF coast station range and without a global maritime distress safety system radio, such as Inmarsat, or HF digital selective calling radio are those mostly affected.

~WIA

DMR REPEATER VK3RWV

DMR Repeater VK3RWV is now online and servicing the Local Government Area of The City of Warrnambool.
Repeater Input: 431.4 MHz (Repeater Receive Frequency) - set radio TX to 431.4 MHz
Repeater Output: 438.4 MHz (Repeater Transmit Frequency) - set radio Rx to 438.4 MHz
Current Output Power: 15W (Range: At 5W: Limited to North of Princes Highway: 15W Tests ongoing)

Steve and Donna, VK3VM-3LDY thank lots of folk for their assistance with regards to getting this device online including ACMA and DMR-MARC networking team.

~WIA

SLEEP U.S. MILITARY STYLE

United States Army has revealed the ultimate trick it use to help military personnel get to sleep in two minutes.

You first need to relax your mind and body and follow these four steps:

1. Relax the muscles in your face, including the jaw, tongue and those around the eyes

2. Let your shoulders drop and relax both sides of the upper and lower arms

3. Breathe out, keeping the chest relaxed

4. Relax both the upper and lower parts of your legs

Once completed, you need to visualise one of two scenarios:

1. Lying in a canoe on a calm lake with nothing except blue skies around you

2. Being wrapped in a black velvet hammock in a dark room

The last step involves you actually speaking, all part of the process:

Slowly repeat the words "don't think" for about 10 seconds.

VK3RTV MELBOURNE TELEVISION REPEATER NEWS

SEPTEMBER NEWS

Due to some very generous donations, we now have enough funds to purchase the required vertical antenna from RFI for Mount View. If you have a look at the photograph we will have the prime spot right at the top for our 445.5 MHz DVB-T output. (The existing antenna is U/S)
I have changed the modulation to QPSK which will not have a great effect on quality, but will provide greater coverage as well.
I found my set top box simply accepted the new modulation without any action from me.

Again, if you have a look at the photograph there are three outriggers close to the top. These are spaced at 120 degrees. The plan is to mount two 23 cm panels angled 120 degrees to each other on each outrigger. If you then look down on the tower, the 23 cm panels will form a hexagon with close to 360 degrees coverage.
Each panel will have a receiver on a separate frequency feeding either VK3RTV1 or VK3RTV2.

The inputs will be horizontally polarised and the output vertically polarised.

As a part of the lease agreement with Melbourne Water, we can only use Riggers that carry the required Insurance. We have Riggers who may or would be able to undertake work, and need to sort out the Insurance issue.
Unfortunately as some of you will know, OH and S has taken hold in Australia with overkill in some instances.

I have undertaken a few Google earth elevation plots on some ATV operators and the site is really very good. You can find the Mount View Reservoir as it is totally covered and adjacent to the Police Academy.
The AR Victoria / Melbourne Water tower is located directly beside the reservoir to the south.
It is NOT the water tower which is similarly located, but to the north end of the reservoir.

The site at Surrey Hills may still become available and if so, can form a component in a network similar to that in California. Both sites are licenced for ATV Repeater operations on 23 cm and 70 cm.

VK3RTV will be on 445.5 MHz QPSK modulation. The reason for the change is that VK3RTV is SD and also QPSK has a 6dB advantage over QAM16.
If you need to, just program up 444.5 MHz and the Set Top Box will do the rest. If you already have 445.5 MHz programed, the Set Top Box should automatically change to QPSK.

I have purchased a cheap RTL/SDR with the aim of using it as a receiver for narrow band DATV on 6 metres. There are a few options for transmit that I am exploring also.

Whilst the WIA Band Plan fully covers 6 metres the realistic situation is that other than 50 – 50.5 MHz SSB there is little activity further up.

I am looking at 52 MHz and above as an option on a no interference basis.

The WIA Band Plan possibly needs to be reviewed now with the advent of more a more flexible approach to allowed modulation processes.

NOVEMBER NEWS

It looks like we have solved a few of the legal issues surrounding Mount View and I have asked Peter Mill to go ahead and order a UHF array from RFI Industries to replace the faulty one on the tower.

RFI have arrays with bandwidths of 400 – 500 MHz which of course are ideal for 70 cm.

They can be ordered with down tilt if required.

This has been funded by very kind donations from members of the Melbourne ATV Group.

I have built three Panel Arrays for 23 cm receive at my cost as there are no commercial antennas available suitable for horizontal polarisation and Omni- directional radiation patterns.

These Panel Arrays consist of two quads set at 1200 to be located at the edge of the triangular tower.

The three panels have been constructed so that the antennas are at DC earth which is a preferred requirement for these types of installations. Both antenna arrays will be at the top of the tower in a prime location.

With three panels located on each edge of the triangular tower the arrangement forms a hexagon of antenna panels with a pseudo 3600 pattern although there will be troughs in the reception pattern.

One pair was used at Olinda with quite a good effect for Melbourne and Geelong stations.

I have conducted a few path profiles from Mount View using Google Earth.

This does not allow for antenna heights however and I have lost the link to a program that does.

Paths to most current ATV Operators seems quite good and certainly anything along the west side bay will be very well served.

Geelong is line of sight. Even Olinda had a blind spot created by One Tree Hill.

For my part, I would have to admit that I can see the tower from the roof of my Ham Shack.

This will mean I can exercise administrative control with ease in any weather conditions.

There are similar commercial operations to that at Surrey Hills which are based on the water tower, but our tower is well displaced from it physically and we have a very good DVB-T Filter funded by Amateur radio Victoria and the Eastern and Mountain Districts Radio Club some time ago. It is possible that the noise floor will be lower than that at Olinda, time will tell on that one.

I have purchased two of the latest pre-amplifier kits from Mini Kits which have an 8 dB improvement over the units we had at Olinda and also Surrey Hills. (We had one new version at Surrey Hills)

This will mean that all three receivers at Mount View will have a 6 dB improvement over those used at Olinda.

I will provide further news as the project develops.

~ Peter Cossins VK3BFG

Flowerpot Radio

I used to have some radio heads in the car mounted on some Lido masts that attach to the car seat mounts.
The Lido mast full length of tubes seemed to shake a bit on rough roads and speed humps around town.

An idea of using the vacant cup holders to install a radio came to mind, using a third the length of tube, to stop shaking.
A spare ceramic pot that just neatly fitted the cup holder space was found and one of the masts cut back and glued in place.
The bottom of the tube was held by JB Weld resin then topped up with Tarzans Grip glue.

Testing the radio around town mobile had it solid steady and just the right height clear of my knees and just in the right sight of vision while driving. It also means no obstructing the drivers view out of the windscreen.

It wasn't Bill, nor was it Ben…. It was Micks idea.

~Mick VK3CH

24GHz Amateur Television DX Tests – Round II

On Sunday 3rd November a 24GHz DX attempt for wideband analogue amateur radio television was carried out between Peter Cossins VK3BFG sited at the Sky High Restaurant Mount Dandenong car park and Mick VK3CH sited at Mount Buninyong Ballarat.
The distance for the attempted test was 127 km
The weather forecast did not look that promising with rain predicted.
Any moisture is serious attenuation at 24GHz.
But with the day one of few that everyone was free, we decided to have a go.

Mick VK3CH portable station at Mount Buninyong Ballarat consisted of;

- 24GHz Analogue Television RX dish into 12 volt TV
- Video camera feeding a DVB-S ATV TX on 1255MHz, FEC 3/4, Symbol Rate 4 Ms/s
- 120Amp Hour 12volt Battery
- Stands, leads, tools

Peter VK3BFG portable station at Sky High Restaurant Mount Dandenong car park consisted of;

- 24GHz Analogue Television 300mW TX dish with video camera feed
- Video camera feeding a DVB-S ATV TX on 1255MHz, FEC 3/4, Symbol Rate 4 Ms/s
- DVB-S ATV TX on 1255MHz, FEC 3/4, Symbol Rate 4 Ms/s

The idea was for me to sight my camera on the TV that was receiving the 24GHz signals from Peter and send these to him on 70cm. Peter would then sight the 24GHz TX dish by watching signals back from Ballarat on 70cm and sight the 24GHz dish by watching a picture back on his TV at Sky High Restaurant Mount Dandenong car park.

Mick sends 70cm video to Peter → Peter uses 70cm beam to see video then uses where 70cm beam points to sight 24GHz dish → Once Peter 24GHz signal received by Mick, Peter sees that on his monitor and knows 24GHz sighting complete

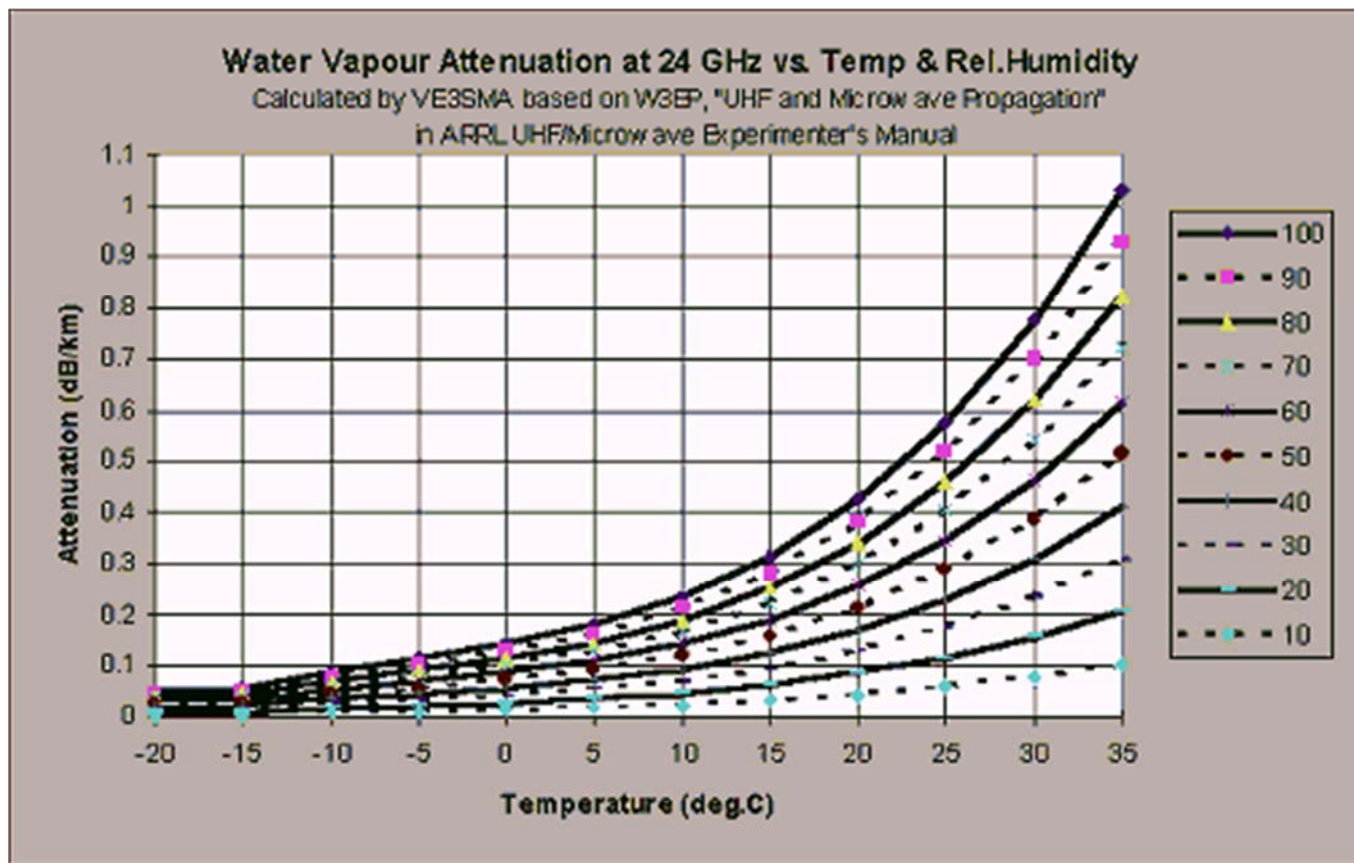Mount Buninyong   Google Earth Elevation Plot   Sky High Restaurant

24GHz PROPAGATION

The propagation characteristics at 24 GHz are quite similar to the lower microwave bands in most respects. That is to say that the most useful propagation is line-of-sight, with occasional enhancement by Tropospheric bending and ducting, and perhaps some Tropospheric scattering with the best available equipment.

However, there is one significant difference, which is that the 24 GHz band falls near the centre of a band which suffers from absorption by water vapour molecules in the atmosphere. This provides an extra challenge for those trying to cover distances of more than a few kilometres. The following graph shows the losses which can be expected through air at different temperatures and with relative humidity from 10 to 100%. Since air can hold more water at high temperatures the losses increase with temperature as well as with relative humidity.

Thus while line-of-sight paths are the ones we try when starting out, they usually require portable operation. But during the summer when we like to be outdoors, it is usually both hot and humid which leads to high losses. For example, from the graph one can see that at 27 degrees and 80% relative humidity the loss is 0. 5 dB per kilometre. So over a line-of-sight path of 50km an extra loss of 25 dB must be dealt with. Tropospheric ducting and refraction which can extend the paths beyond the horizon rely on variations of the refractive index of the air due to its water content, and can become more pronounced if the humidity is high. So in order to get a long path we need to put up with lots of path loss! However, the challenge is not insurmountable as shown later by some examples of what can be done. If nothing else it provides an incentive to do some microwave operating in the winter when both lower temperatures and lower relative humidity prevail. That same 50 km path at 0 degrees and 40% relative humidity suffers only about 0. 05 dB/km loss or 2. 5 dB in total. So this path could be done on a typical winter's day with 22. 5 dB less power (a factor of nearly 200 times less) than in summer.

Water Vapour Attenuation at 24 GHz vs. Temp & Rel.Humidity

Calculated by VE3SMA based on W3EP, "UHF and Microwave Propagation" in ARRL UHF/Microwave Experimenter's Manual
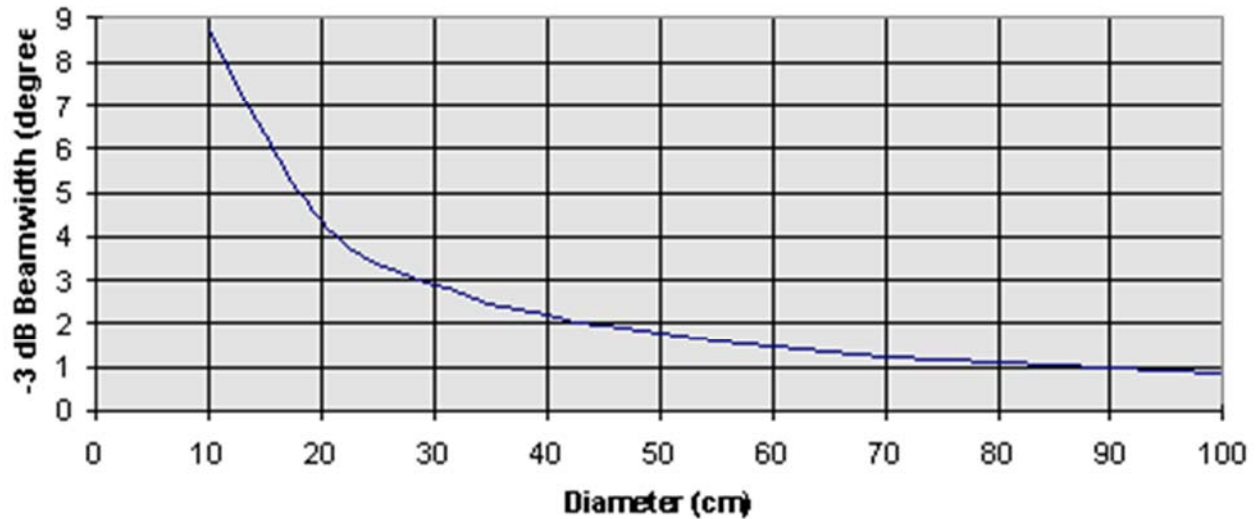
At 24 GHz the difficulty in pointing the dish is often the limiting factor.

A 60 cm dish when portable can be very critical to point (but very effective once aimed correctly!). The figures below show the typical beamwidth and gain versus dish diameter at 24 GHz.

Typical Dish Gain vs Diameter at 24.125 GHz
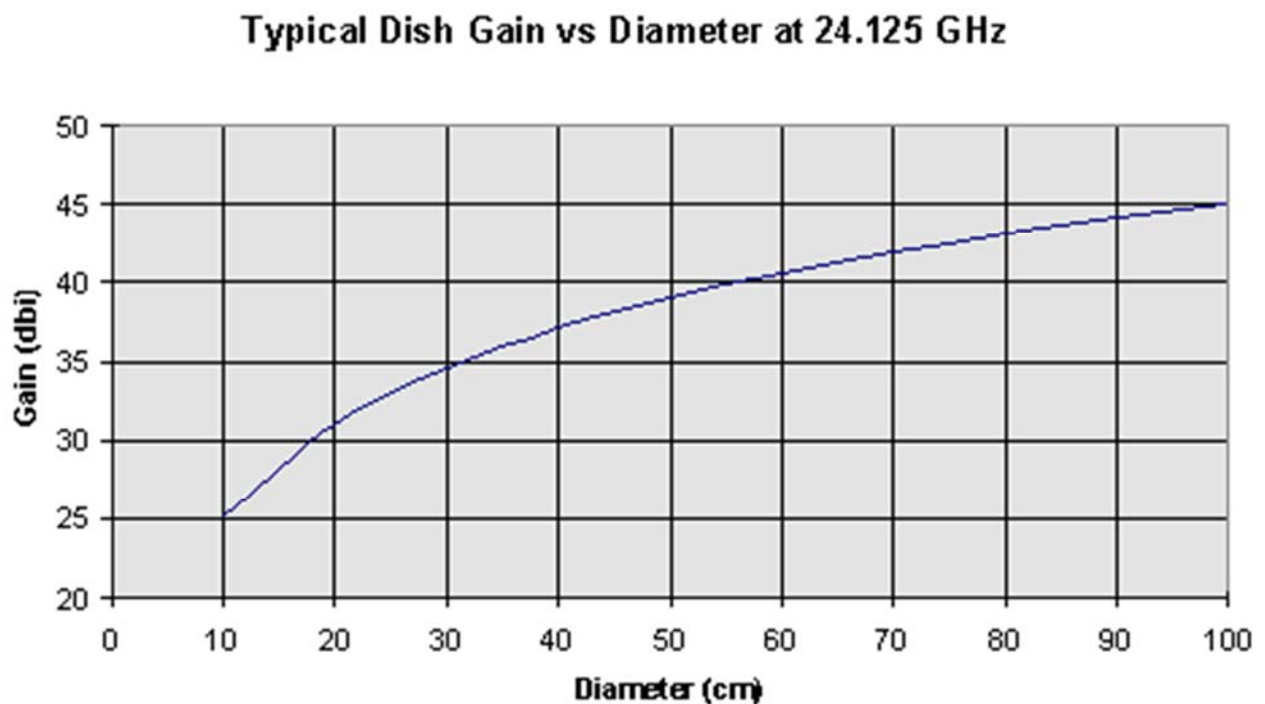
Typical Dish Beamwidth vs Diameter at 24.125 GHz

DISH DATA

I use for both TX & RX, PROCOM 24 GHz parabolic Antenna 36dBd, diameter 48cm, F/D=0.4.
This is a completely assembled parabolic dish antenna, white coated, with band designation.
I added the Khune waveguide, flange and feed horn.
SWR at 24.225GHz < 1.25. Angle of optimum radiation 2.5°

PACKING LIST

23cm TRANSMITTING GEAR

23cm DVB-S ATV TX Unit + 'N' Coax
23cm Loop Yagi Beam + Mast + Stand + 'N' Coax
23cm VSWR Meter + 'N' Coax Patch Lead
On Screen Display – Pre-programmed with portable site information – Grid Square Locator QF12XI13GI
Video Camera + Base Clamp + Tripod Stand + RCA Leads + DC Lead

24GHz RECEIVING GEAR

24GHz RX Dish + RCA Leads + Mast + Tripod Stand + Level
Portable 12 volt DC Television + Remote + DC Lead

GENERAL

High Gain 2 meter / 70 cm Mobile Whip
HF Mobile Antenna
120 Amp Hour 12 Volt Battery – fully charged
DC Power Distribution Board
Digital Camera
Tools
Multimeter
Spare Leads – RCA, DC
Electrical Tape
Spirit Level
Mobile Telephone
Maps
Compass
Coffee
Spare Warm Clothes + Jacket

I always plan to pack a few days before, but as always, life gets in the way and all was done in a rush the day prior.

But nothing was forgotten on the day – my memory can't be too bad… yet.

Google Maps said allow 2 hours 20 minutes to the site, but I left at 7.01am and arrived 9.00am, but not much traffic on a Sunday.

Ian VK3AXH met me at his favourite local site, talking me in on 2 meters.

Setting up was done in about half an hour, I have done quite a few times now portable.

Biggest worry was the weather, it looked gloomy but not actually raining, my fear was moisture absorption of the 24GHz signal.

All setup ready

View towards Mount Dandenong in the distance

Adjusting the 24GHz RX Dish Sighting

The mist is visible, 24GHz does not like that

The "Outside Broadcast Van"
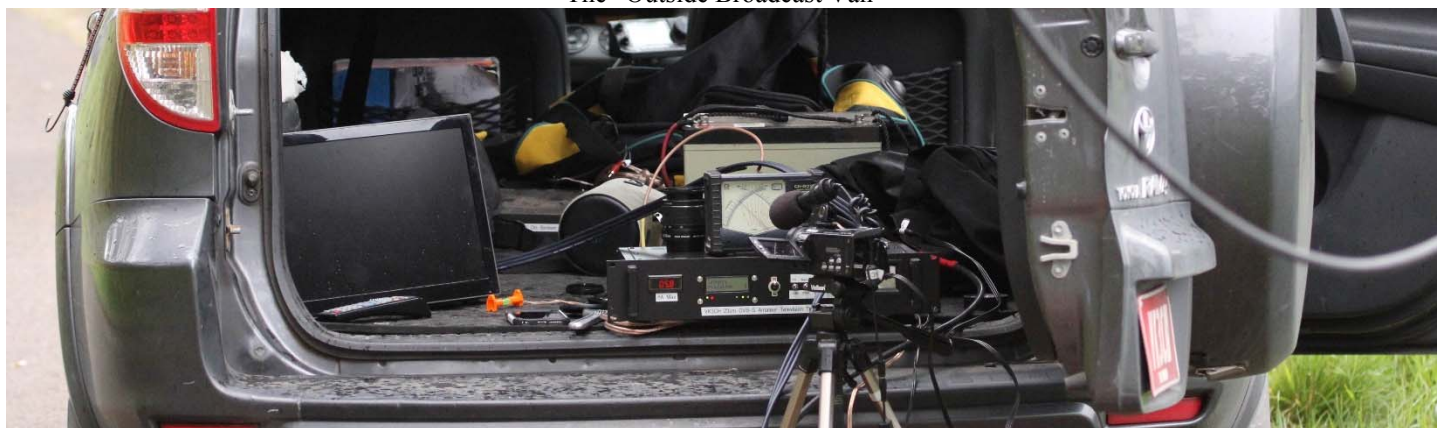
Perfect 1:1.05 VSWR

DVB-S ATV TX running on full power

At the other end, Peter was setup and Melbourne stations were talking to him.
Peter eventually got a lock on my 23cm DVB-S signal but could not get picture as he had some local interference.

Peter setup at Sky-high Restaurant Carpark

My DVB-S transmitter was running full power of just under 6 watts into the loop yagi beam.
I could hear him clearly on 2 meters S9, but Peter did not hear me either on 2 meters simplex, I resorted to using the mobile phone to liaise the test, but he was also busy with Melbourne stations talking to him as he patched signals to VK3RTV.
I did not hear all the Melbourne stations on 2 meters, but the few I did boomed in.

As the weather was deteriorating, we ditched the 23cm link and just tried to get a signal on 24GHz from Peter to myself.
My jacket got used to protect the transmitter from the rain instead of myself – priorities!

I had the TV volume right up, so if any signal was received from Melbourne it would be heard, that way I can concentrate on sighting the dish, a sprit level used to maintain correct position after moving it about.

After much sighting tries, it looked like the moisture was absorbing the 300mW signal from Melbourne.

I got a few looks at the station setup on the side of the road, from passing cars, cyclists and walkers, but I'm a ham, I'm used to it…
As I packed up the rain came down in earnest and rained on the drive all the way back to home.

The WIA 24GHz Band Plan
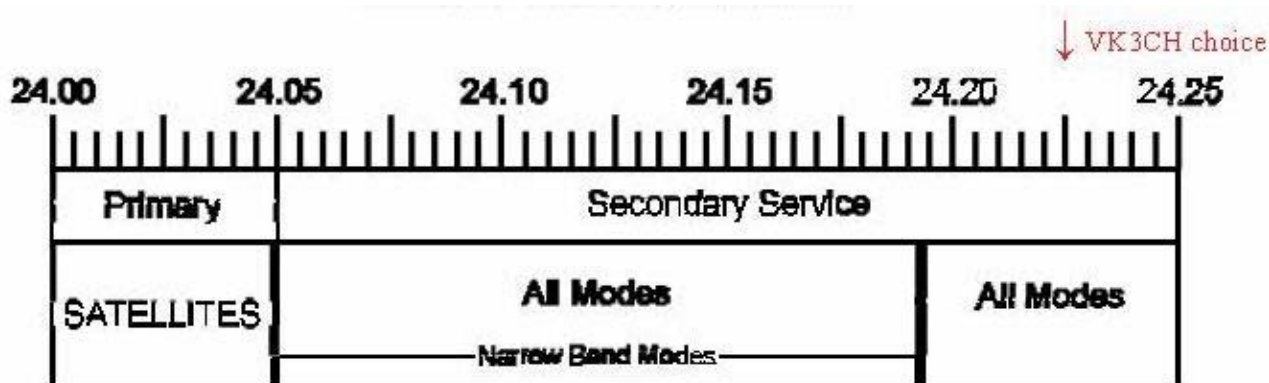
So no success this time.
As I am unsure of the maximum distance with 300mW TX, further experiments are needed to ascertain the range.
With summer on the way another opportunity for a test and a BBQ will happen…

One of the first tests of a close distance of 100 meters last year at Bundoora Park

~Mick VK3CH

Rosebud Hamfest Report

The Rosebud Hamfest was on 17th November.
Attendances were very good, but getting people to part with their cash is a major effort.
This time I made it to some of the lectures which are quite informative.

At $10 for a table its good value to sell goods.
Quite a few good prizes were in the raffle draw.

The pictures tell the story…

Worth the trip, lots of different stalls, some with the old junk and others with news stuff.

~Mick VK3CH

The Foundation Licence

The hobby of Amateur Radio has a long and proud tradition that is worth knowing. It began with experimenters dabbling in the then scientific oddity of wireless, went through the broadcasting era of the 1920s, and grew strongly after WWII. The people involved in it became the mainstay of technical professions and developed much of the technology we use today.

A lot has changed in Amateur Radio, but it is even more relevant and accessible than ever before.
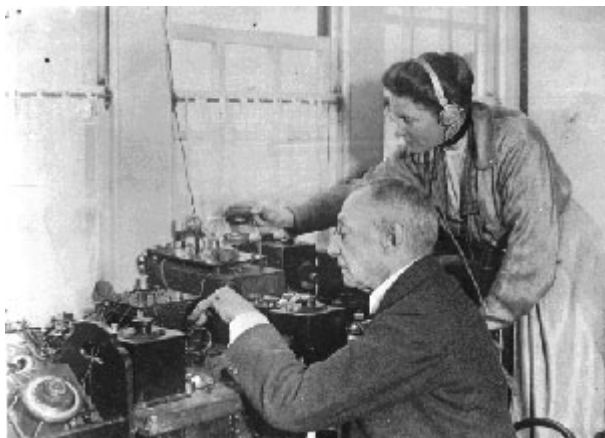
Sir Henry Jackson - Radio Pioneer

Things You Will Need To Know

The emphasis is now on those wanting to enjoy Amateur Radio, to have the knowledge and skills to demonstrate a practical ability to put together a station from commercial equipment, and operate it safely, competently and without causing interference to other users of the radio spectrum.

The aim of the Foundation Licence is to be a stepping stone or entry point, giving you a real taste of Amateur Radio and the fun it provides.

In summary you will learn the how Amateur Radio relates to other users of the radio spectrum, licence conditions, technical basics of electricity and electronics, transmitters, receivers, feedlines and antennas, propagation, electromagnetic compatibility (EMC), and electromagnetic radiation (EMR).

Construction and Digital Modes

On the 12th of September 2019 the ACMA introduced a number of changes to amateur licence conditions. From these changes foundation licence holders, both existing and new, are permitted to construct their own transmitting equipment and make full use of available digital modes. The amendments increase the flexibility, utility, and relevance of the Foundation licence by removing unnecessary restrictions, while balancing the risk of interference to other radio spectrum users.

Foundation Manual Update Supplement

An Update Supplement to the Foundation Manual Third Edition has been released and covers changes to the manual with the introduction of Digital modes and Construction for the foundation licence holder. The supplement can be found by clicking "The Foundation Licence Manual" in the left hand menu.

Radio Bands You Can Use

The Foundation Licence can operate in the bands listed below using the modes listed in the right hand column. Use of both commercially manufactured or home brew transmitting equipment is permitted.

Radio band	Frequency	Permitted Emission Modes
80 Metres	3.500 MHz - 3.700 MHz	Any emission mode. Where the necessary bandwidth exceeds 8 kHz, the maximum power spectral density from the transmitter must not exceed 1 watt per 100 kHz.
40 Metres	7.000 MHz - 7.100 MHz	
40 Metres	7.100 MHz - 7.200 MHz	Any emission mode with a necessary bandwidth no greater than 8 kHz.
15 Metres	21.000 MHz - 21.450 MHz	Any emission mode. Where the necessary bandwidth exceeds 8 kHz, the maximum power spectral density from the transmitter must not exceed 1 watt per 100 kHz.
10 Metres	28.000 MHz - 29.700 MHz	Where the necessary bandwidth exceeds 16 kHz, the maximum power spectral density from the transmitter must not exceed 1 watt per 100 kHz.
2 Metres	144 MHz - 148 MHz	Any emission mode.
70 Centimetres	430 MHz - 450 MHz	

## Distances You Can Work

Radio band	Distance & Coverage
3.5MHz (80 metres)	Typically up to 150KM during the day and up to 3000KM at night.
7MHz (40 metres)	Typically up to 1000KM during the day and during good conditions world wide at night.
21 MHz (15 metres)	World wide mostly during the day.
28 MHz (10 metres)	World wide during periods of high sunspot activity and up to 3000km in summer.
144MHz (2 metres)	Local coverage and world wide via "IRLP" and EchoLink.
432MHz (70cm)	Local coverage, over 2000 km using something known as tropospheric ducting and world wide via "IRLP" and EchoLink.

The WIA Foundation Licence Manual is a book containing relevant information for those studying for a licence. Because it is so easy to read and understand, has also become a reference book on lots of common topics.

The manual has all the relevant information you will need to successfully complete a training course to obtain a Foundation Licence. It also contains a wealth of information all radio amateurs need, like understanding Band Plans, electrical safety, operating procedures, how to contact a local radio club, the WIA and much more.

The Foundation Licence Manual - Your Entry Into Amateur Radio – is available from several sources. It can be purchased by clicking Foundation Manual on the left hand menu bar of this webpage, from the WIA office in Melbourne, via many radio clubs, and many equipment suppliers. The price is $34.50 plus postage, WIA members can purchase the Foundation Manual at the special members price of $24.50 plus postage.

A popular way to learn more about Amateur Radio is to attend interesting lectures often held by knowledgeable radio amateurs. There are over 70 radio clubs with training courses for the Foundation Licence. Some training courses are held over several weeknights, while most are on a weekend.
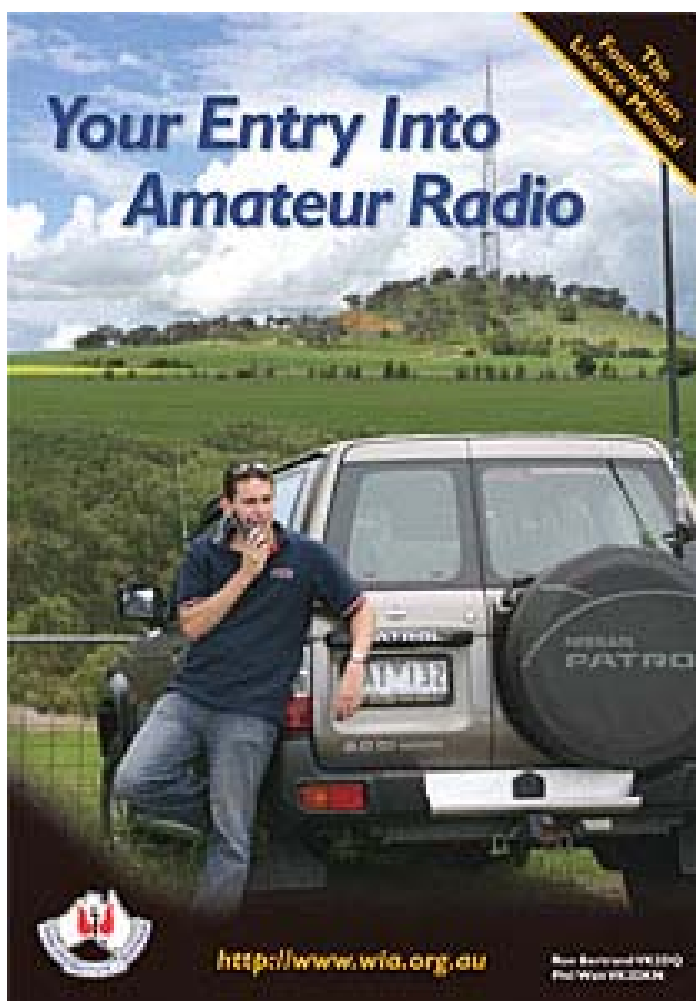
Assessments

The examination and callsign recommendation services previously provided by the WIA ceased on 1-Feb-2019.

In future these services will be provided by the Australian Maritime College (AMC)
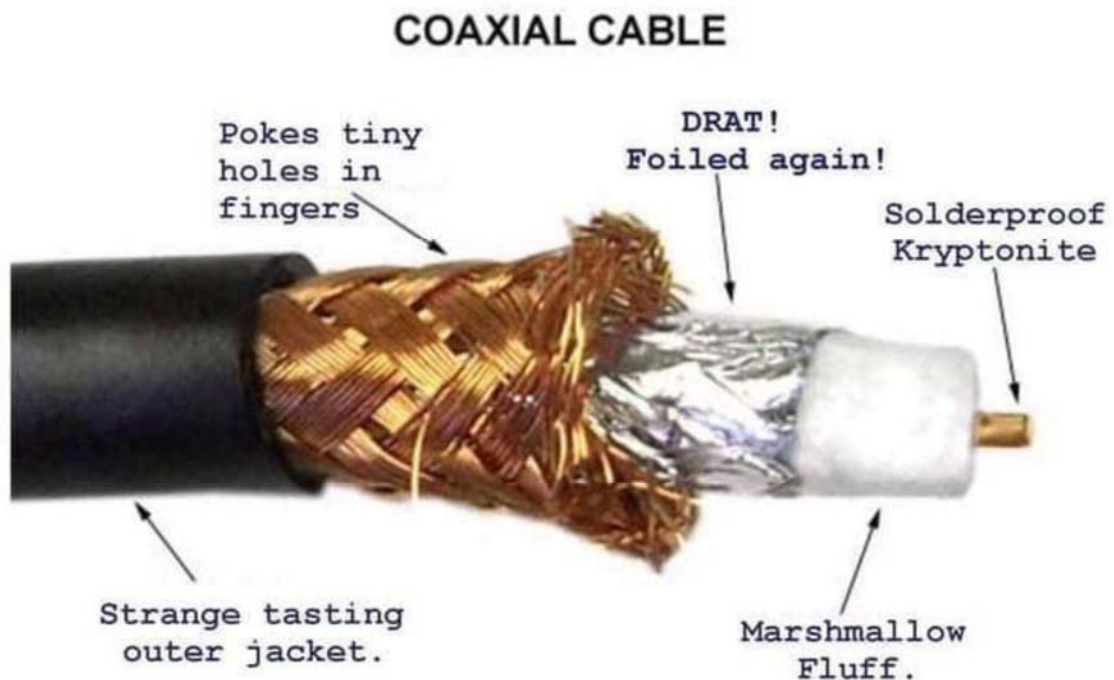
NEVARC NEWS
THE MAGAZINE FOR MEMBERS

Got a story to tell?
Working on a project that is of interest to others?
Got gear to sell, buy and swap?
Looking for that hard to get part or information?
Seen something interesting that others should know about?

NEVARC Editor always looking for stories from members.

Send your news to Mick, VK3CH, at
magazine@nevarc.org.au

Don't think you're a good writer???

Just email photos and text to Mick and he can write it up for you.

COAXIAL CABLE

Pokes tiny holes in fingers

DRAT! Foiled again!

Solderproof Kryptonite

Strange tasting outer jacket.

Marshmallow Fluff.

STEAK TIMER

RARE...........1 BEER

MEDIUM....2 BEERS

WELL.........3 BEERS

THE BEST TONIC HAS A LARGE GIN IN IT!

Australian Government

Australian Taxation Office

GRANDPA TAX AUDIT

The tax department (ATO) decides to audit Grandpa, and summons him to the ATO office. The ATO auditor was not surprised when Grandpa showed up with his lawyer.

The auditor said, 'Well, sir, you have an extravagant lifestyle and no full-time employment, which you explain by saying that you win money gambling. I'm not sure the ATO finds that believable.'

'I'm a great gambler, and I can prove it,' says Grandpa. 'How about a demonstration?' The auditor thinks for a moment and says, 'Okay. Go ahead. 'Grandpa says, 'I'll bet you a thousand dollars that I can bite my own eye.' The auditor thinks a moment and says, 'It's a bet.' Grandpa removes his glass eye and bites it. The auditor's jaw drops.

Grandpa says, 'Now, I'll bet you two thousand dollars that I can bite my other eye.' Now the auditor can tell Grandpa isn't blind, so he takes the bet. Grandpa removes his dentures and bites his good eye.

The stunned auditor now realizes he has wagered and lost three grand, with Grandpa's lawyer as a witness. He starts to get nervous. "Want to go double or nothing?" Grandpa asks. "I'll bet you six thousand dollars that I can stand on one side of your desk, and piss into that wastebasket on the other side, and never get a drop anywhere in between."

The auditor, twice burned, is cautious now, but he looks carefully and decides there's no way this old guy could possibly manage that stunt, so he agrees again. Grandpa stands beside the desk and unzips his pants, but although he strains mightily, he can't make the stream reach the wastebasket on the other side, so he ends up pissing all over the auditor's desk.

The auditor leaps with joy, realizing that he has just turned a major loss into a huge win. But Grandpa's own lawyer moans and puts his head in his hands. "Are you okay?" the auditor asks.

"Not really," says the lawyer. "This morning, when Grandpa told me he'd been summoned for an audit, he bet me twenty-five thousand dollars that he could come in here and piss all over your desk and that you'd be happy about it!

Teacher: "Kids, what does the chicken give you?"
Student: "Meat!"
Teacher: "Very good! Now what does the pig give you?"
Student: "Bacon!"
Teacher: "Great! And what does the fat cow give you?"
Student: "Homework!"

Reaching the end of a job interview, the Human Resources Officer asks a young engineer fresh out of RMIT, "And what starting salary are you looking for?"
The engineer replies, "In the region of $125,000 a year, depending on the benefits package."
The interviewer inquires, "Well, what would you say to a package of five weeks leave, 14 paid holidays, full medical and dental, company matching retirement fund to 50% of salary, and a company car leased every two years?"

The engineer sits up straight and says, "Wow! Are you kidding?"
The interviewer replies, "Yeah, but you started it."

NEVARC Nets

40M Net
Monday, Wednesday and Fridays
10am Local time (East coast)
7.095 MHz LSB
Approximately + or - QRM
Hosted by Ron VK3 AHR

80M Net
Wednesday 20:30 Local time
3.622 MHz LSB
Hosted by Ron VK3 AHR
Using the club call VK3ANE

2M Nets
Monday at 2000 local time on
VK3RWO repeater
146.975 MHz

President, VK2VU, Gary
Vice President, Tom VK3NXT
Secretary, VK2FKLR, Kathleen
Treasurer, Amy

NEVARC CLUB PROFILE

History

The North East Victoria Amateur Radio Club (NEVARC) formed in 2014.
As of the 7th August 2014, Incorporated, Registered Incorporation number A0061589C.
NEVARC is an affiliated club of the Wireless Institute of Australia.

Meetings

Meetings details are on the club website, the Second Sunday of every month, check for latest scheduled details.
Meetings held at the Belviour Guides Hall, 6 Silva Drive West Wodonga.
Meetings commence with a BBQ (with a donation tin for meat) at 12pm with meeting afterwards.
Members are encouraged to turn up a little earlier for clubroom maintenance.
Call in Via VK3RWO, 146.975, 123 Hz tone.

VK3ANE NETS

HF

7.095 MHz Monday, Wednesday, Friday - 10am Local time
3.622 MHz Wednesday - 8.30pm Local time

VHF

VK3RWO Repeater 146.975 MHz – Monday - 8pm Local time
All nets are hosted by Ron Hanel VK3AHR using the club callsign VK3ANE

Benefits

To provide the opportunity for Amateur Radio Operators and Short Wave Listeners to enhance their hobby through interaction with other Amateur Radio Operators and Short Wave Listeners. Free technology and related presentations, sponsored construction activities, discounted (and sometimes free) equipment, network of likeminded radio and electronics enthusiasts. Excellent club facilities and environment, ample car parking.

Website: **www.nevarc.org.au**   **Postal:**   **NEVARC Secretary**
                                                            PO Box 69
Facebook: **www.facebook.com/nevicARC/**   **Wahgunyah Vic 3683**